



THE CRITICAL PATH

A FLIGHT PROJECTS DIRECTORATE PUBLICATION ■ 2019 SUMMER ISSUE

GODDARD WELCOMES Summer Interns

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Goddard
Celebrates

60
YEARS

1959 - 2019

GODDARD BIDS FAREWELL TO
Center Director
Chris Scolese

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The deadline for the next issue is
October 28, 2019



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Message from the **DIRECTOR**

Welcome to another edition of The Critical Path.

As most are aware, Chris Scolese, our Center Director for the past seven years, has retired from NASA and has started his next adventure as the Director of the National Reconnaissance Office. It has been a real honor to have worked with him over his many years at Goddard, including in the Flight Projects Directorate, as well as at NASA Headquarters. We all wish Chris the best in the future. George Morrow is now the acting Center Director and we will continue to work closely with him in his new position as he and his staff juggle the many tasks and responsibilities in the Center Director's office.

The James Webb Space Telescope's spacecraft element successfully completed its thermal vacuum testing and just completed a significant integration event with the telescope being successfully mated to the spacecraft. It's all coming together as we continue on the track to launch in less than two years.

A big congratulations to the Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) and Ocean Color Instrument (OCI) teams for their successful confirmation review on August 15. This is a huge milestone, many years in the making for a mission that is so important to Earth Science and to Goddard with its significant in-house development activity. Also in the Earth Science area, Landsat 9's Thermal Infrared Sensor (TIRS)-2 in-house instrument was successfully completed and is now being shipped to Arizona for integration to the spacecraft.

Very exciting new work is coming our way in the form of the Mars Sample Return (MSR) Capture, Contain, and Return System (CCRS) project, and the Dragonfly project. The MSR is being led by JPL and Dragonfly is being led by APL with significant hardware elements being developed here at Goddard. And congratulations as well to the Science-Enabling Technologies for Heliophysics (SETH) team for their selection for a Phase A study.

I want to acknowledge the MEME-X, FOXSI, MESOSAT, and CAESAR teams who did not get selected in the latest rounds of Announcement of Opportunity competition. These teams put everything into their mission concepts and, I believe, are well positioned for future competitions. Thank you to all who committed so much of their time and energy. Also, a thank you to all of the Discovery mission proposal teams for their recent proposal submissions (feedback to come from NASA Headquarters in the months ahead).



In the Space Communications arena, we in Code 400/450, along with Center leadership, paid a visit to MIT/Lincoln Labs in June. There are some great partnering opportunities between Goddard and MIT, and we look forward to leveraging off of past collaborations for future work. Also in Space Communications, Goddard's Space Network Ground Segment Sustainment (SGSS) project achieved a significant milestone in August with the first time successful communication with one of the on-orbit Tracking and Data Relay Satellites (TDRS). Well done SGSS team!

It has not been a big launch year for Goddard, but hopefully we can wrap up the latter half of 2019 with a successful launch of the Ionospheric Connection Explorer (ICON) in early October. The spacecraft is in great shape as we stand by for the green light from the launch vehicle team on the Pegasus launch system.

We had another busy summer with high school and college interns. The energy and results the interns bring to the Center every summer is always inspiring. I really enjoyed the "Let's CONNECT" sessions we had with the interns, as well as the "Be Courageous in Your Career" Panel discussion, the Project Showcase for Interns, and the annual Poster Sessions. Thanks to the mentors out there for investing in our "people pipeline" and in our future.

Lastly, I along with the entire Goddard community were saddened to hear of the sudden passing of Steve Scott, our Goddard Chief Engineer. He was an incredible talent and brought so much to every mission he was involved with. Steve was a one of a kind personality; he will be greatly missed.

David F. Mitchell
Director, Flight Projects
david.f.mitchell@nasa.gov

A WORD FROM THE DEPUTY

In the latest video in our recurring series, Dr. Wanda Peters highlights innovation and creativity on display as the FPD community selects a new logo design.

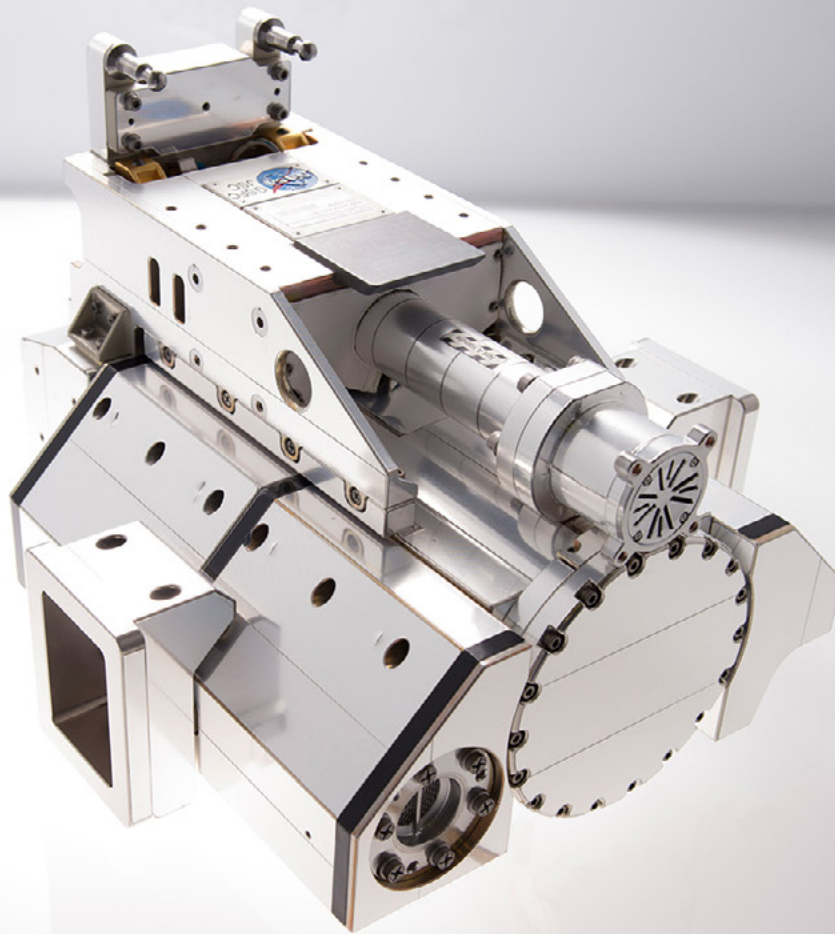


(left to right): Tim Yarnell, MITLL Optical Communications Technology Group; Scott Stadler, Division Head, Communications Systems Division; Chris Scolese, GSFC Director; George Morrow, GSFC Deputy Director; Mark Brumfield, Deputy Program Manager/Implementation; Dr. Christyl Johnson, GSFC Deputy Director for Technology and Research investments; Dr. Wanda Peters, FPD Deputy Director for Planning and Business Management; David Mitchell, FPD Director; Bob Menrad, Associate Director; Jay Pittman, Assistant Director for Strategic Integration. CREDIT: NASA

FPD Director Dave Mitchell and Deputy Director for Planning and Business Management, Dr. Wanda Peters, joined Goddard senior management and conducted a partnership meeting at the Massachusetts Institute of Technology Laboratory (MIT-LL) with Communications and Navigation community leaders to discuss advancements in laser communications, SmallSats and quantum networking. ■

@MITLL

Advancements in laser communications



SECOND DELIVERY OF NASA'S ROBOTIC EXTERNAL LEAK LOCATOR ARRIVES AT THE ISS

NASA is sending humans forward to the Moon, this time to stay. Upcoming expeditions to the Moon will require making every moment of astronaut time outside the safety of the Gateway in orbit and lunar lander system on the surface count. Robotics will enable lunar crews to do more while minimizing their risk.

NASA's [Satellite Servicing Projects Division](#) is teaming up with the [International Space Station](#) to develop the technologies for this kind of astronaut-robotic collaboration, and launched a [Robotic External Leak Locator \(RELL\)](#) aboard Cygnus on Northrop Grumman's 11th Commercial Resupply Services mission on April 17.

Spacecraft and habitats rely on their cooling systems. Just as coolant in a car is used to cool its engine, ammonia is circulated through a huge system of pumps, reservoirs and radiators on

station to cool its complex life support systems, spacecraft equipment and science experiments. Without proper cooling, the equipment would fail. RELL is a "sniffer," or a robotic, remote-controlled tool that helps mission operators detect the location of external ammonia leaks on space station and rapidly confirm a successful repair.

"RELL capabilities help mitigate the risk of the potentially severe impacts to the space station presented by an external ammonia leak," said Christopher Crow, ISS Senior Systems Integration Lead at NASA's Johnson Space Center in Houston.

RELL arrived at the ISS roughly 37 hours post-launch, making it the second RELL unit onboard. The first-flight RELL was already aboard station where it [successfully located a leak in one of these systems](#), significantly reducing astronaut time required outside of station to inspect and repair the leak.

"The decision to build and fly another flight unit seemed like the obvious choice to ensure this capability was going to be available to the ISS Program through the rest of spacecraft's life," said Adam Nails, ISS Hardware Development Engineer at NASA's Johnson Space Center.

After Cygnus delivers the second RELL to station, the plan is to store the unit until an ammonia leak is detected. Then, a game of "hot and cold" would begin. Affixed to the Canadian Space Agency's Dextre robot arm, RELL would be moved around the outside of station using its mass spectrometer "sniffer" to locate ammonia leaks.

The RELL design includes two sensors: a mass spectrometer and a total pressure gauge.

The mass spectrometer measures the masses of molecules present to create a "mass spectrum" reading. Based on this data, analysts determine the composition of present gases. The mass spectrometer can distinguish between trace orbital gasses, which occur naturally, and chemicals potentially originating on station, such as ammonia. This tool can tell the difference from a football field length away.

When RELL is pointed toward a leak, it returns a higher signal. The higher the signal, the closer the leak. This process allows RELL to pinpoint the source of any given ammonia leak, giving space station managers the information they need to understand and correct the problem.

Before RELL, astronauts manually searched for leaks on spacewalks. The Leak Locator that is currently stationed in-orbit has proven its worth, paving the way for the second unit.



Testing RELL at GSFC before launch. CREDIT: NASA

Both RELL units will be stored in the Robotics Tool Stowage, or RiTS, when it arrives to station. RiTS is currently slated to launch on Cygnus NG-12 in the fall. Once installed to the outside of station, the RELL instruments will be stored inside so they are available when needed to track down a leak.

The total pressure gauge measures the total pressure in space. After the general vicinity of a leak is known, the pressure gauge is able to pinpoint it within a few inches in real time.

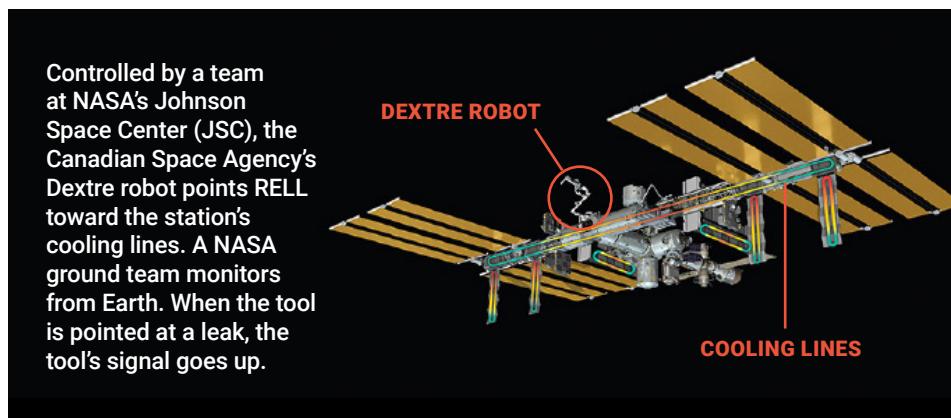
The benefits of leak detection have already been proven on station, and this ability could be similarly helpful for long-term human habitation on the lunar Gateway, a lunar habitat, and perhaps one day a crewed voyage to Mars. At its core, RELL is a robotics-controlled characterizer of the local environment. This same

ability could be used to determine the composition of nearby environments for exploration on the lunar surface, and for scientific and resource utilization purposes.

The president's direction from [Space Policy Directive-1](#) galvanizes NASA's return to the Moon and builds on progress on the Space Launch System rocket and Orion spacecraft, collaborations with U.S. industry and international partners, and knowledge gained from current robotic assets at the Moon and Mars.

Whether reducing the risk to astronauts on station or one day "sniffing out" the environment of an extraterrestrial world, the human-robotics collaboration demonstrated by RELL will be a vital part of NASA's exploration future. ■

Kathryn Cawdry / Code 480
SSPD Outreach Lead



Controlled by a team at NASA's Johnson Space Center (JSC), the Canadian Space Agency's Dextre robot points RELL toward the station's cooling lines. A NASA ground team monitors from Earth. When the tool is pointed at a leak, the tool's signal goes up.



Finding Home in the Sublime

SALUTOGENIC ARCHITECTURE AND SPACE HABITATION

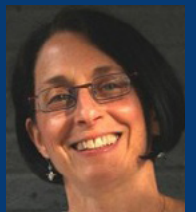
Marcus Vitruvius Pollo, more often called, simply, Vitruvius, is one of the earliest architectural theorists. His treatise, “De Architectura” or “On Architecture,” places extant Roman buildings in the context of life in ancient Rome, defining their usefulness in society. Referencing Vitruvius, Louis Sullivan, an early twentieth century architect considered a father of modernism, declared “form follows function,” implying that all architecture should

be judged on how well its design serves those who inhabit it.

In space, form doesn’t necessarily follow function. Human space habitation is rooted, by necessity, in pragmatism. The realities of space travel lead to tight, confined spaces; aesthetics can’t be prioritized. The human experience of space takes a backseat to the systems that protect humans from space.

Ruthan Lewis hopes to change that.

NASA Engineer Ruthan Lewis’s background in both architecture and engineering makes her uniquely suited to the design challenges of space habitation. Her forward-looking theories on the relationship between wellness and the space environment could make long-duration spaceflight a more pleasant – even enjoyable – experience.



CREDIT: ENVATO ELEMENTS



CREDIT: SPACE.COM

"When you look at human performance in extreme environments like space," said Lewis, "It's important to take human factors into account, finding tangible ways to address these factors and integrating human systems with built ones."

Lewis applies her diverse background in both terrestrial architecture and space habitation to the challenges of long-duration spaceflight. She seeks to employ salutogenesis, a hybrid Greek and Latin term which means "the origins of health," to space architecture, promoting wellness among astronauts off-world.

Aaron Antonovsky, an American-Israeli medical sociologist, introduced the salutogenic framework in the 70s and 80s. He wanted to orient medical care towards engendering health, rather than towards mitigating risks or treating diseases. He desired a sense of coherence, which he defined as:

"A global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that:

1. The stimuli from one's internal and external environments in the course of living are structured, predictable and explicable;
2. The resources are available to one to meet the demands posed by these stimuli; and

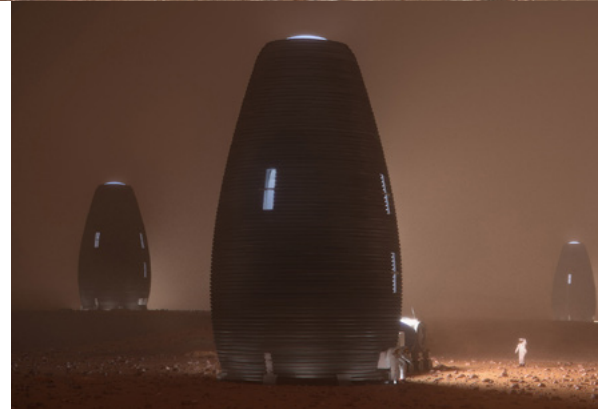
3. These demands are challenges, worthy of investment and engagement."

Essentially, Antonovsky wants spaces that provide order and purpose for those that dwell in them while providing them with the resources they need to live their lives meaningfully.

As NASA goes forward to the Moon and establishes a sustained presence there, the mental and physical wellbeing of astronauts will be paramount. Lewis is applying her understanding of salutogenic principles to the architectural spaces NASA designs for its astronauts. In doing so, she hopes to improve the quality of life for those living and working in space.

"What I'm interested in is enabling the highest degree of human performance and the human experience – what a human can achieve in a particular environment, their relationship with it and their transcendence as result of their interaction," said Lewis. "Biomechanics, ergonomics, architecture: these are all both qualitative and quantitative studies, which makes them all the more intriguing."

Salutogenic architecture places particular emphasis on the relationship between spaces and the physiological responses they inspire. A goal of this architecture is to promote wellness through conscientious design and aesthetics.



CREDIT: SPACE.COM

Applying salutogenesis in space – where cramped, sterile quarters are the norm – could reduce stresses of long-duration human spaceflight, like the emotional toll of isolation or the physiological strain of the microgravity environment.

Lewis projects her knowledge of the built environment on Earth into space, creating tangible design guidelines from pseudo-abstract principles. She judges space habitat design on three major salutogenic qualities: **comprehensibility, meaningfulness and manageability.**

Continued on page 10

COMPREHENSIBILITY

Extent to which one perceives stimuli



CREDIT: NASA

Terrestrial homes are dynamic, changing with the seasons and the environment around them. Architects understand how these changes impact humans in built environments on Earth, but NASA habitation designers and human factors specialists must address these changes in space, relating earthly experiences to this extreme environment and discovering new aspects of experiences that one may never be able to achieve on Earth.

On the International Space Station, whipping through the sky at 17,500 miles per hour, the view changes every second. Astronauts experience a sunrise every 90 minutes. The “outdoors” of the station can only be experienced through another built environment –

a spacesuit. There is no direct tactile exposure to this “outside.”

These changing interactions with space impact astronauts’ feeling and understanding of “home.” Understanding the emotional and physiological responses to these environments can help engineers better design for astronaut wellbeing.

Lewis proposes a number of architectural manipulations to enhance the comprehensibility of space for astronauts. As an example, manipulation of scale can alter the sense of distance and mass. An engineer could design a habitat that makes Earth feel closer or makes the void of space more distant by manipulating perspective.

MEANINGFULNESS

Extent to which life makes sense and problems and demands are worth investment



CREDIT: NASA

“It suddenly struck me that that tiny pea, pretty and blue, was the Earth,” said Apollo 11 astronaut Neil Armstrong of seeing Earth from space. “I put up my thumb and shut one eye, and my thumb blotted out the planet Earth. I didn’t feel like a giant. I felt very, very small.”

This kind of perspective, dubbed the “Overview Effect,” is common among spacefarers. Encountering Earth from so far away leads to a unique kind of introspection, a sense of sublime awe.

As NASA astronaut Mike Massimo put it, “How can something so beautiful be tolerated by human eyes?”

Lewis hopes habitat engineers embrace the sublime experience

of spaceflight in their designs, arranging spaces to facilitate a positive perception of the meaningfulness of astronauts’ work. External views to the outside remind astronauts of their place among the stars. Spaces can be arranged to produce positive anticipation and motivation. Compression and expansion of thresholds invokes a sense of expansion and increased volume.

Further, Lewis wants habitats to promote a sense of community, enabling personal and purposeful interactions between explorers. She recommends creating resting and gathering places that facilitate personal and social actions and activities.

MANAGEABILITY

Extent to which one perceives resources to meet demands posed by the stimuli



CREDIT: SPACE.COM

“Form follows function,” so, to meet the ever-evolving needs of astronauts, form must be mutable, fluid. As the functions performed by astronauts change, the forms they dwell in must adapt.

Lewis proposes that habitats be customizable to changing mission landscapes. Building flexible spaces that respond to dynamic environments could improve astronaut safety by providing them with autonomy in response to the unforeseen. The resulting sense of flexibility would empower astronauts to execute their mission with agility.

Additionally, these adaptable spaces must be sustainable,

allowing resources to be managed productively and responsibly. As an example, she considers a Trombe wall, a passive solar heating design used in buildings on Earth, for heating space habitats. She researches how naturally occurring lava tubes could shelter astronauts from radiation. She’s among those that consider recycling materials for use as radiation or other useful products.

“There’s a term we use when talking about efficiencies in space: ‘logistics to living,’” said Lewis. “How can we take items otherwise considered trash or expendables and turn them into vital pieces of a mission?”



CREDIT: SPACE.COM

Since Vitruvius, understanding the relationships between humans and the spaces they occupy has been the goal of architecture. Like Vitruvius before her, Lewis is a futurist of sorts; an architect hoping that, through salutogenesis, she can design a future where NASA astronauts feel at home amongst the sublime.

“Considering the relationship between our astronauts and the spaces they occupy will not only help NASA with its long-term objectives,” said Lewis, “but also help optimize planetary and orbital structures for human habitation.”

Ruthan Lewis serves as the Exploration Systems and Habitation manager for the Exploration Systems Project (ESP), housed within the Exploration and Space Communications (ESC) projects division.

For more information about ESP or ESC, visit esc.gsfc.nasa.gov/esp. ■

Danny Baird / Code 450
Technical Writer



Goddard
Celebrates

60
YEARS

1959 - 2019

On July 29, 1958, President Eisenhower signed the National Aeronautics and Space Act, establishing the National Aeronautics and Space Administration. When it began operations on October 1, 1958, NASA consisted mainly of the four laboratories and some 80 employees of the government's 46-year-old research agency, the National Advisory Committee for Aeronautics (NACA).

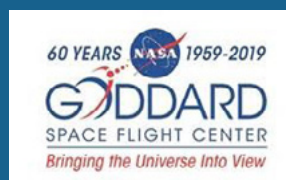
On May 1, 1959, the Beltsville Space Center in Greenbelt, Maryland, was renamed NASA's Goddard Space Flight Center in honor of [Robert H. Goddard](#), widely considered the father of modern rocketry. Thus began a 60-year boom in science and technological innovation.

The Center has led or contributed to many of the Agency's accomplishments, ranging from missions to the Moon to detecting the first light in the universe and arriving at an asteroid in space to collect a sample. Goddard now boasts the largest concentration of scientists and engineers dedicated to the study of Earth and space and has successfully sent more than 300 satellites into orbit, secured more than 800 patents, produced more than 50,000 science and technical publications, and contributed to several significant awards, including the Nobel Prize in physics.

On April 29, 2019, hundreds of current employees gathered on the Goddard mall to mark this momentous anniversary. Many tours, presentations and other events were held during the first week of May to add to the celebration.

Goddard Center Director, Chris Scolese, sent an inspiring message on May 1, 2019, which concluded, "Space exploration is among the greatest endeavors in history. At its core, it remains a human endeavor, which has been made possible through the contributions of our past colleagues and current employees. It will continue to thrive thanks to the inspiration we impart to future explorers by pushing the boundaries of possibility every day.

"As our namesake, rocketry pioneer Robert H. Goddard, famously said, 'It is difficult to say what is impossible, for the dream of yesterday is the hope of today and the reality of tomorrow.' No place exemplifies his words better than the NASA center bearing his name. Thank you for turning dreams and hopes into reality for the past 60 years. Here's looking forward to the next six decades."



Read more from the Office of Communications press release and view the commemorative video at: <https://www.nasa.gov/press-release/goddard/2019/nasa-s-goddard-space-flight-center-celebrates-60-years>.



CREDIT: TAYLOR MIKAEL

TECHGIRLS

Visit Goddard!

On July 9, 62 young women from all over the world visited Goddard as part of the TechGirls Legacy International Program. Several FPD employees were among the large group who volunteered their time as speakers, panelists, escorts, and organizers to make the visit, hosted by Dr. Christyl Johnson, Deputy Director for Technology and Research Investment, a huge success.

TechGirls is an international summer exchange program designed to empower and inspire young women from the United States, Central Asia, and the Middle East and North Africa to pursue careers in science and technology.

The centerpiece of the program is a week-long technology camp that provides participants with an in-depth examination of technology-related topics, such as coding and cyber security, and engages them in more than 45 hours of hands-on instruction. The camp is complemented by additional activities such as site visits to technology companies, leadership clinics, community service opportunities, job shadowing, and cultural events. As part of program follow-on, the TechGirls implement at least one peer training program or service project within their schools and/or communities.

Their day at Goddard included panel discussions with female scientists and engineers, visits to a thermal blanket lab and the Satellite Servicing Project Division

(SSPD), a tour of the spacecraft and integration complex, with an overview of the Wide Field Infrared Survey Telescope (WFIRST) project, and culminated in a tour of the Goddard Visitor Center. At the end of their visit to Goddard, while waiting outside for the rest of their group, several of the girls expressed their overall impressions. Staff members asked each of them to express their feelings about the visit in their own language and then translate into English. The comments they had were overwhelmingly positive! The staff were delighted to hear how honored the girls were to be invited to come to NASA, how they didn't want to leave, how much they were overjoyed about being here and talking to everyone, and especially how they knew they would come back one day and work here.

Thanks to Briana Horton, GSFC Protocol Officer, for contributing to this article.

For more information on TechGirls or to volunteer, visit:

○ <https://legacyintl.org/techgirls/>



FPD Director Dave Mitchell (at right) and deputy directors Tom McCarthy and Dr. Wanda Peters presented Center Director Chris Scolese with a commemorative plaque. CREDIT: TAYLOR MIKAEL

Farewell and Congratulations!

On Wednesday, July 31, Goddard bid farewell to outgoing Center Director, Chris Scolese. A farewell celebration in his honor was held at the Hinners Auditorium on July 26, where FPD Director, Dave Mitchell, presented him with a commemorative plaque.

Chris has had a long and varied career, beginning in industry and, following his appointment to Goddard in 1987, progressing through several areas of Earth science before serving as deputy associate administrator in the Office of Space Science at NASA Headquarters. He was subsequently appointed as Goddard deputy director, then as NASA's chief engineer. He also served as the NASA acting administrator and as NASA associate administrator at NASA Headquarters, before assuming the Goddard Center Director's role in March 2012.

His next position will be as Director of the National Reconnaissance Office.

Goddard Deputy Center Director, George Morrow, has been named Goddard's Acting Center Director. George came to Goddard in 1983 and worked in several flight projects before serving as the deputy director, then director of the Flight Projects Directorate. He has served as Goddard's Deputy Center Director since April 2015.

In his first official meeting as Goddard Center Director, George met with the Pre-Aerosol, Clouds, and ocean Ecosystem (PACE) project team, shown right.



GSFC Acting Director, George Morrow, with FPD and PACE team members (left to right): Jeremy Werdell, PACE Project Scientist; Gary Davis, PACE Lead Systems Engineer; Kathleen McIntyre, PACE Deputy Project Manager; Bill Sluder, PACE Deputy Project Manager/Resources; Andre' Dress, PACE project manager, Tom McCarthy, FPD Deputy Director; Cathy Richardson, Earth Science Projects Division Associate Director; Wanda Peters, FPD Deputy Director for Planning and Business Management; Mark Clampin, Deputy Director of the Sciences and Exploration Directorate; Dave Mitchell, FPD Director. CREDIT: NASA

The Polar Operational Environmental Satellites (POES) project is the direct continuation of projects that began in the 1970s with NASA's TIROS-N weather satellite, launched in October 1978. GSFC built fifteen satellites in the TIROS-N series under reimbursable agreement with NOAA beginning

In 1998, NOAA entered into an agreement with the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) to contribute instruments developed by the POES project to two European Meteorological Operational (MetOp)

For more information, visit:
<https://poes.gsfc.nasa.gov/>

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Summer INTERNS

This summer, the Flight Projects Directorate (FPD) funded 98 students – 73 interns and 25 contractor summer hires.

In addition to their regular workload, students participated in a variety of events throughout the summer. The events sponsored by FPD and FPD's Diversity & Inclusion (D&I) Committee included a "Be Courageous in Your Career" Panel discussion, where students heard from several employees about showing and seeing courage in the workplace. During FPD's Project Showcase for Interns, students met with 19 projects and the Safety and Mission Assurance Directorate to learn about the projects and the people who make them successful. FPD and the Space

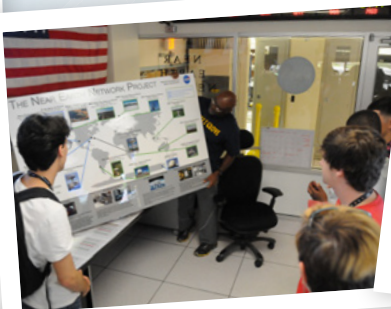
Communications and Navigation (SCaN) Intern Project (SIP) both sponsored buses for students to tour Wallops Flight Facility (WFF). Students saw the Range Control Center (RCC), the backbone behind all of Wallops' launches, and the Near Earth Network (NEN) Global Monitor and Control Center (GMaCC). The GMaCC operates and maintains the antennas at Wallops, White Sands, McMurdo, Florida, and Bermuda, logs information about spacecraft contacts and enables the NEN to provide ground-based telemetry, commanding, and tracking services for NASA's spacecraft. After spending some time at the facility, the students traveled to the 18 meter Ultra High Frequency (UHF) CubeSat

ground station where currently, a majority of the agency's CubeSat data is received. The day closed out with a trip to NASA's privately-owned beach. After touring Pad Oa, where the Antares spacecraft is launched, the students spent a little time relaxing on the beach.

Students also had the opportunity to meet with Dave Mitchell (Director of FPD), Tom McCarthy (Deputy Director of FPD), and Wanda Peters (FPD's Deputy Director for Planning and Business Management) in two Let's CONNECT sessions. During each of these hour-long sessions, students got to know FPD's senior leaders and other students. The students were very engaged in asking questions and Dave, Tom, and Wanda gave great advice! ■

Katherine Schauer / Code 450
Shannon Smith / Code 403

CREDIT: MICHELLE BELLEVILLE,
BRENDAN KAVANAUGH, SHANNON
SMITH, DARRELL WARE, TODD
GOOGINS





NASA Invited to Patent & Trademark Office to Celebrate Apollo 50th



Panel members included (left to right): Laura Peter, Deputy Under Secretary of Commerce for Intellectual Property and USPTO Deputy Director; Paul Richards, former astronaut and former GSFC Strategic Partnership Manager for TEMPO and ESC; Kathryn Sullivan, former astronaut; Frank Cepollina, former Satellite Servicing Capabilities Office Associate Director and USPTO Inventors Hall of Fame Inductee.
CREDIT: USPTO

In 1969, NASA engineers, scientists, astronauts, and innovators banded together to send humans to the Moon for the very first time, but they required outside assistance to make it happen. With the help of small technology companies across the globe, John F. Kennedy's vision became reality. On July 20, 1969, Neil Armstrong and Buzz Aldrin set foot on the surface of the Moon—a moment made possible through collaboration between technology pioneers worldwide.

The United States Patent and Trademark Office, or USPTO, celebrated these partnerships in an Apollo 50th Anniversary celebration on July 23. The sold-out event filled 500 seats and offered standing room only in the Clara Barton Auditorium of the USPTO located in Alexandria, VA. NASA Administrator Jim Bridenstine gave the keynote speech, followed by a panel of federal government executives, astronauts, inventors, and commercial industry executives.

The discussion centered around the technology that sent Apollo astronauts to the Moon, where it came from, and how it has developed over time.

"This tech has improved the human condition in a way that was never expected when Eisenhower created NASA," Bridenstine said. "The way we communicate, navigate, produce food, and produce energy is changing."

In the '60s, NASA recruited tech companies to send people to the Moon, and has plans to do so again. In the coming years through the Artemis program, NASA will send the first woman and the next man to the Moon to stay. Following extensive research and experimentation, NASA astronauts will take what they've learned and journey to Mars.

"Things you thought were impossible could happen," Astronaut Kathryn Sullivan said on a panel. "We need to set bold goals, and the challenge of this country is not to blink."

While NASA works with tech companies to make Artemis a reality, the Agency's past achievements are reflected in everyday technology. The Apollo missions benefitted humanity by laying the groundwork for quake-proofing, rechargeable hearing aids, food safety, and digital flight control.

"We at NASA like dreaming of the future," Former Associate Director of the NASA's Satellite Servicing Capabilities Office and USPTO Inventors Hall of Fame Inductee Frank Cepollina said. "But what's happening today, tomorrow, and the next day?" ■

Kathryn Cawdry / Code 480
SSPD Outreach Lead

A Joyful Journey

It was such an honor to be the keynote speaker to celebrate Asian American Pacific Islander Heritage month. I have always been proud to be an American and to be able to represent the awesome Hawaiian Kama'ainas! This request had come at an interesting time in my life, as I have been doing much reflecting on where I've been, where I'm going, and where I want to go. Through all the myriad circumstances and situations, I noticed a distinct pattern of joy.

I have always loved math and it was doubly nice to hear it described as the "universal language." Always coming easy for me, as a child I thought I was weird since most people said it was hard. I kept my love for math to myself, but some of my teachers took note and asked me to help tutor others. I thought it was really cool to get paid for something I loved and found easy to do. I used my money to buy a math encyclopedia which deepened my passion. When I learned of the Fourier Transform, I thought I had found the key to life! I even named my first car Fourier. Thankfully, I tested out of undergraduate math in high school, so in college I was really free to take many other courses along with higher level math. However, many people were asking me what

I was going to do with a math degree. I figured since it was the universal language, it had to be useful for many different types of jobs.

I have always been a space geek. Every day at 4 p.m., my Dad and I faithfully watched Star Trek. The "Trouble with Tribbles" was my all-time favorite episode. I saw myself working closely with Scotty, figuring things out, and telling Captain Kirk that his requests were unreasonable! When Star Wars came out, I loved everything Star Wars. My best friend and I saw the movies multiple times to get all the free souvenirs. I won't say how many times because that would be too incriminating! The best Christmas gift I received from my parents was the original movie artwork (which I still have). So when people asked me, "what you want to be when you grow up?" I always said that I wanted to work in space – but that was a pipe dream for a kid from Hawaii. I was shocked when I heard later from NASA employees that the reason they came to work at NASA was because of a visit from NASA recruiters to their college. If NASA had visited Hawaii, I would've been on board immediately!



Cathy during her modeling days. CREDIT: ALL PHOTOS COURTESY OF CATHY PEDDIE

My journey to NASA was not a straight line. I had a couple of careers before getting hired by NASA. In high school and college, I had an awesome time modeling. I thought it was cool to get paid to wear designer clothes and have my picture taken. After doing a gig at the largest international fashion show for the Pacific Rim, I decided to focus on college and became a cadet in the United States Air Force (USAF) Space Reserve Officer Training Corps. Who would've thought someone in modeling would end up in the AF, right?!

Understanding international relations and politics is important when going to international events. It pays to be aware of politics in any situation. It's who you know and who knows you. No matter where people come from, we are all similar in our hopes, dreams, and aspirations. And finally, enjoy the moments (you only get them once).

Being part of the USAF's first set of Undergraduate Space Training (UST) corps was really exciting. We were breaking new ground! We were at Lowry Air Force Base (AFB) in Denver,

of 22, I was in charge of a multi-billion dollar facility and satellite constellation as well as military and civilian personnel. Building upon my previous career, I discovered more about international relations and politics as well as the impacts to national security.

I met the love of my life, Andrew Peddie, in UST. We recently celebrated our 32nd wedding anniversary and can NOT believe that much time has passed. We still have so much fun together and the cool thing is that our careers coincide and parallel.



Cathy with Captain Gerald Coffee, author of "Beyond Survival".



USAF Space Command Officer.



Cathy and Andrew on their wedding day.

During my modeling career, I got to meet Captain Gerald Coffee, a naval aviator who survived a Hanoi prisoner of war camp during the Vietnam War and author of the book "Beyond Survival." A very inspiring individual to say the least. I love one of his quotes "Our lives are a continuing journey—and we must learn and grow at every bend as we make our way, sometimes stumbling, but always moving, toward the finest within us." This would become very true for me as I forged ahead in my careers.

As I look back, I realized some lessons from my modeling career I still carry with me today. First, a smile goes a long way. I found that interpersonal skills are critical.

Colorado during ski season. I believe we had way more fun than the pilots in the movie Top Gun! We were young officers with time and money, having tons of fun in Colorado. I learned how to ski and drive in snow – a big deal for an Island girl. I still remember the other cars leaving lots of room when they saw my Hawaiian license plates. Or perhaps it was my first 360-degree spin through a busy Denver intersection...

As a USAF Space Command Officer, I finally got to realize my childhood dream of working in space. AND I got to use math! Space Command was fairly new and the hot place to be. My first job was on the Defense Support Program at Buckley AFB in Denver, Colorado. At the tender age

We were blessed to be able get stationed together and work on the Defense Meteorological Satellite Program at Fairchild AFB in Spokane, Washington. I was hand-selected to bring on the nation's first nuclear blast-hardened facility. We were to be the designated survivors. Quite sobering to realize the state of the world at the time. I worked with the best crew in the USAF! We not only brought online a new facility, but saved a tumbling satellite. AND I got to use math again! We won numerous awards and formed strong bonds. As a military supervisor, I believed what General Patton said, "Never tell people how to do things. Tell them what to do and they will surprise you with their

Continued on page 20



USAF crew at the Defense Meteorological Satellite Program.

ingenuity.” I gave many people a chance to find positions more suited to their skills and capabilities. My reputation for being fair as well as compassionate had numerous personnel coming to my crews. We accomplished many things for the USAF, had fun, and kept the nation safe at the same time.

When one of my crew members decided to leave the USAF and join NASA, this caused my husband and me to pause. Having grown up in the military, I thought we would retire from the Air Force. After considering all our options, weighing pros and cons, we decided to leave the USAF and start our NASA careers.

Looking back, I realized some reflections from my USAF career. First of all, personnel management is key. This also can lead to organizational excellence. Giving people another chance and options can reap huge rewards. Not only did I find the right positions for people, but they gave back more than was asked. Persevere through all the ups and downs. Along with that, I found that a common enemy cements a team. Be aware of global and national issues (it provides explanations for many things).

Again, enjoy the moments (there are so many of them to enjoy).

Becoming a NASA employee was taking my dreams of working in space to the next level. I was hired into the Space Station Freedom program at NASA Glenn Research Center (GRC) in Cleveland, Ohio. The Space Shuttle was to be used as a transportation and assembly platform, but my group had a concern about loads on the cargo bay trunnion locations. Using the shuttle user’s guide, I calculated the various scenarios and provided my results to management. They were horrified and told me there were engineers to do that type of work. That was my first time being told to stay in my lane. After the engineers did their task, I saw that my calculations were a little more precise and I had done the old-fashioned hand calculations! Nevertheless, I really enjoyed being on teams and loved how NASA had so many experts to tap into. It was quite a relief to be able to rely on my fellow teammates to solve complex technical issues. I also got to meet people who focused on the fundamental sciences called scientists and researchers. I loved working with them! Their passion and knowledge enthralled

me. I formed many strong bonds with individuals and the scientific community, not realizing how important that would be in my future jobs.

I learned quickly that when our country changed administrations, NASA’s focus often changed. When Space Station was reorganized, I was picked up by the Space Experiments Division and became a project manager for two microgravity experiments. The first one was unprecedented in that it would span the shuttle cargo bay. Good thing I knew all about that area from my first NASA job! Another change at NASA and I became a project manager in the High Speed Research Program. More changes and I became a deputy program manager for several programs. I learned so much working with industry and other government agencies as we transferred technologies to industry. Next time you are sitting on an airplane, look out your window. When you see the winglets and serrated engine nacelles you can thank my programs!!



Serrated engine nacelles (top) and aircraft ‘winglets’ (bottom) were developed for NASA programs.



Cathy met Neil Armstrong (top left) and was featured in several television programs (top right) while working with LRO. Bottom right photo shows Cathy in front of the WFIRST mockup.

After several years in the aeronautics side of NASA, I became Deputy Director of the Office of Strategic Management. At the time GRC's future was uncertain and all employees had to fill out reduction in force (RIF) resumes. My past knowledge, experience, and relationships were put to good use as I worked closely with Center management on revitalizing and reorganizing GRC. I also learned much about how NASA fits into local and global marketplaces. All those experiences were very enriching. As I look back, I realized some reflections from my time at GRC. Personnel management is still key. Organizational excellence is a must or you will be replaced. Scientists and researchers are the heart of NASA. It is crucial to know your marketplace (global, national, local) if you want to remain relevant.

Collaboration and partnering with other centers, Government agencies and international organizations are critical. Be resilient, embrace the change. Because of the many changes I experienced, I have come to really like change. I have seen many great things happen from change. Finally, you can make a difference. I saw firsthand how my contributions helped NASA save a vital organization.

With the changes at GRC, my husband and I again realized that we needed to change jobs again. I transferred to Goddard Space Flight Center (GSFC) and started in Code 300 in the Assurance Management Office. It was cool to see that GSFC had individual quality assurance personnel for each mission since while at GRC I had to create that expertise on my teams. The

opportunity to work on the Lunar Reconnaissance Orbiter (LRO) provided great experience working on a GSFC in-house mission. I got to know how GSFC really works and met so many awesome people! LRO was a lot of work but also a lot of fun. There was so much publicity and we had fun putting on numerous public and outreach events. I love fostering not only the public's interest in our missions but enabling our future employees. I have been blessed with being able to create numerous opportunities for people who are interested in contributing to NASA.

There were so many celebrities that came out to meet us on LRO. I loved that I got to meet Mr. Sulu from Star Trek! It was cool and very humbling to be featured on so many programs on television and on the

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web. One of my favorite photos was when I got to meet Neil Armstrong. He was so gracious and nice. Hard to believe that a kid from Hawaii got to meet the first Man on the Moon!!

After LRO, I got to work on the Joint Dark Energy Mission (JDEM). I discovered that astronomers use lots and lots of math. They were speaking my language! Our team got a jazz when we saw that JDEM was prominently featured in the opening scene of the movie Avengers. We knew that we were REALLY cool at that point. JDEM was then turned into what is now the Wide Field Infrared Survey Telescope (WFIRST) mission. We built up a solid team that is helping set the stage for GSFC's future. As on LRO, it was cool to be featured on so many public and outreach events. I was blessed again, to be able to create even more opportunities for people to contribute to another in-house mission at GSFC.

My latest career move has taken me back to what I had started to do before I left GRC. I love working with and meeting new people as well as figuring out how best to attain excellence using organizational development techniques. I have seen great results in my careers with the best squadrc. in the USAF, a revitalized NASA center, and numerous excellent teams being built throughout my career. I also

love looking at the bigger picture and figuring out strategies toward future endeavors.

As I look back on over three decades, I see some amazing correlations in my varied jobs. Each actually laid the foundation for the next! There were so many exciting opportunities and I was blessed to be positioned to take advantage of them. Each was such an enriching learning experience. I met so many great people along the way. I realized that my natural curiosity served me well and that it is good to be curious as you enter into a new situation. Just showing up and contributing whatever I could helped in each situation. Also giving back and helping others can truly be a great gift you give to both the people and the organization.

Guess what? Through the USAF Space Command and NASA, the Hawaiian kid actually got to work in space! And use math :-)

I look forward to the next chapter, the next job, the next experience, and all the people that I will meet and experience life with. ■

Catherine Peddie / Code 400
FPD Associate Director



Cathy and Andrew prepare to view the solar eclipse in 2017.



WHAT'S UP WITH FPDP COHORT #3?

Flight Projects Development Program



The Flight Projects Development Program (FPDP) is a rigorous, two-year program designed to develop highly skilled flight project management personnel through an accelerated learning and development curriculum. Participants attend required and elective coursework, complete two specially selected work assignments, attend various developmental opportunities, receive comprehensive mentoring, and develop a Capstone Project.

On May 21-22, Goddard's Flight Projects Development Program hosted a leadership training workshop at Johnson Space Center in Houston, TX. Cohort #3 members, Ben Hall, Joe Stevens, Cathy Stickland, and Jesse Walsh, along with 45 representatives from all other NASA centers, focused on NASA project management for exploration and technology. Over the two days, participants heard from key subject matter experts on recent project management and systems

engineering lessons learned, as well as toured Johnson Space Center to learn about what goes on there. They also had multiple networking opportunities with NASA leaders and workshop participants from across NASA, government, and industry.

Cohort #3 is halfway through their two-year program. In addition to taking on their second assignment, they're continuing with their core curriculum training while launching their capstone project.

We are looking forward to our upcoming Workshop #3 focusing on Political Engineering which is being held October 29-31 at the Lockheed Martin Vision Center in Arlington, VA. ■

Donna Swann / Code 400

Cohort #3 FPDP Program Manager, FPD Assistant Director



NASA Astronaut and former Johnson Space Center Director, Mike Coats, gives some advice to our cohort members and shares stories about his human spaceflight project management experience.



During the tour of JSC, we visited the Neutral Buoyancy Lab (NBL).



(left) Donna Swann, Joe Stevens, Ben Hall touring JSC.

Stay tuned for exciting news about our upcoming Cohort #4 fall recruitment efforts!

For more information about the FPDP, please look for an overview on the FPD Hub, or contact Donna Swann at:

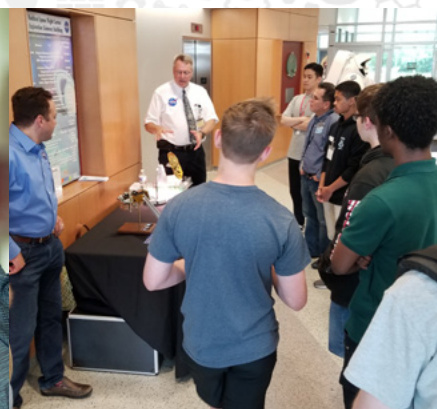
 donna.j.swann@nasa.gov



As a companion program to the most recent STEM Girls Night In event that occurred in the Fall of 2018, nearly 50 young men participated in the inaugural STEM Boys Night In event that took place June 7-8. Rising juniors and seniors from Maryland and Virginia came to the Goddard campus toting backpacks, sleeping bags and pillows, along with an appetite for learning that could turn their love of science and math into potential career options. They learned about Goddard's role in past, present and future space endeavors. They also got a chance to solve The Lunar Challenge, a 3-hour project-based learning activity where they worked in teams to design, build, test, and deploy a model rover using Legos and other materials. For more information about the event, go to [STEM Boys Night In](#). Photos of the event can be found on Goddard's [Flickr](#) page. ■

STEM Boys Night In

Maureen Disharoon / Code 443





THE CRAIG TOOLEY INITIATIVE

Satellite Servicing Team honors Craig Tooley with a day of service

NASA's Satellite Servicing Projects Division hosted a day of volunteering at Greenbelt National Park as part of the newly-established Craig Tooley Initiative. Trail maintenance at the Park drew 30 NASA Goddard employees and their guests. Despite a steady downpour of rain, the volunteers worked cheerily from noon to 3 p.m. on Friday, Aug. 23 in an effort to give back to the community in which they work.

The Initiative was created to remember and honor an influential NASA project manager who lost his battle to pancreatic cancer in Sept. 2017. Tooley was a father, a husband, an outdoorsman and a Greenbelt resident who was passionate about getting involved in the local community. Tooley was also a key member of some of Goddard's most

high-profile space exploration missions, including the Hubble Space Telescope Servicing Missions and the Lunar Reconnaissance Mission. He was also a two-time recipient of the NASA Outstanding Leadership Medal. Tooley's wife and daughters also attended the event to accept a plaque recognizing his outstanding contributions to SSPD.

This event was just the first installment of a recurring series of opportunities to give back to the Greenbelt community. These volunteering events are always open to all NASA employees and their guests. ■

Kathryn Cawdry / Code 480
SSPD Outreach Lead



30 volunteers came out to Greenbelt Park on a rainy Saturday. CREDIT: COURTNEY LEE/NASA

SSPD project manager, Ben Reed, presented Craig's wife, Terri Rutledge (shown with daughters Ursula and Maia), with a walnut plaque displaying a patch that flew over 12.5 million miles aboard the International Space Station. CREDIT: COURTNEY LEE/NASA



CODE 400

FPD

PEER AWARDS & ACHIEVEMENTS



**FPD
FEST
'19**

Our second annual FPDFest was held on June 18. The event featured FPD's Peer Awards, and included recognition of FPD's accomplishments over the last year, voting on the new logo, networking, lunch, Rita's Italian Ice, and door prizes.



Rachel Brinson

BOUNDLESS ENERGY



For demonstrating an eagerness to help others, take the lead, think outside the box and find solutions to problems.

WITH DAVE MITCHELL, MISSY MEYERS, FAIZA HARTNETT AND TOM MCCARTHY

Jermaine Starks

BOUNDLESS ENERGY



For his outstanding leadership and teamwork and going above and beyond in support of the Exploration and Space Communications projects division.

WITH DAVE MITCHELL, ROBIN KRAUSE AND TOM MCCARTHY



Cory Helm

BOUNDLESS ENERGY



For maintaining a positive attitude and is a true team player – always willing to assist in any way possible.

WITH DAVE MITCHELL AND TOM MCCARTHY



Joanne Baker

HANG TEN



For demonstrating an eagerness to help others, take the lead, think outside the box and find solutions to problems.

WITH DAVE MITCHELL AND TOM MCCARTHY



Continued on page 28



Catherine Peddie

HONORING DIVERSITY & INCLUSION



For her tireless efforts to promote cooperation and camaraderie among all team members.

WITH DAVE MITCHELL AND TOM MCCARTHY

Ashley Hume

MENTOR "UNDER YOUR WING"



For fostering innovation through mentorship, guiding and honing the talents and passions of those under her tutelage.

WITH DAVE MITCHELL, DANNY BAIRD AND TOM MCCARTHY



Felipe Romo

MENTOR "UNDER YOUR WING"



In recognition of your commitment and mentorship in helping each and every one of your team members to be their very best.

WITH DAVE MITCHELL AND TOM MCCARTHY



Robert Caffrey

MISSION IMPOSSIBLE



For making Rideshare a reality on the L-9 mission.

WITH DAVE MITCHELL, ROB LILLY AND TOM MCCARTHY





Alice Liu

MISSION IMPOSSIBLE



For your outstanding accomplishments in developing the WFIRST Integrated Model.

WITH DAVE MITCHELL AND TOM MCCARTHY

Katherine Schauer

MISSION IMPOSSIBLE



For demonstrating an eagerness to help others, take the lead, think outside the box and find solutions to problems.

WITH DAVE MITCHELL, DANNY BAIRD AND TOM MCCARTHY



Jeffrey Brown

ROOKIE OF THE YEAR



For the excellent cost modeling support to FOXSI.

ROBERT MONTGOMERY ACCEPTING ON BEHALF OF JEFFREY BROWN WITH DAVE MITCHELL AND TOM MCCARTHY



Samantha Miller

ROOKIE OF THE YEAR



For always going above and beyond the call of duty.

WITH DAVE MITCHELL, ART JACQUES, AND TOM MCCARTHY



Continued on page 30



Robin Minor

ROOKIE OF THE YEAR



For outstanding effort preparing the Restore-L Integrated Project Team for Spacecraft CDR.

WITH WANDA PETERS, DAVE MITCHELL AND TODD KING

Carla Matusow

SILO SLAMMER



In recognition of Carla's outstanding leadership and dedication of the Agency's highly visible Disruption Tolerant Networking development project.

ROBERT MENRAD ACCEPTING FOR CARLA MATUSOW WITH DAVE MITCHELL AND TOM MCCARTHY



Debra Dodson

STEADY HELM



In recognition of Debbie Dodson's significant financial and programmatic achievements on the LCRD mission, enabling continued mission success of a high-profile project.

WITH DAVE MITCHELL AND TOM MCCARTHY



Zac Dolch

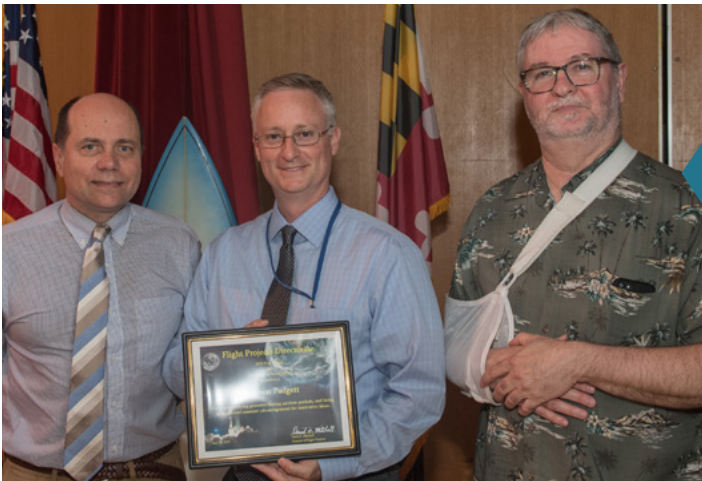
STEADY HELM



For his dedication and teamwork approach to solving L'Ralph instrument problems. His focused strategies are enabling an on-time delivery of this new interplanetary instrument.

NOT IN ATTENDANCE





Stephen Padgett

STEADY HELM



For your steadying presence during anxious periods, and being the source of constant encouragement for innovative ideas.

WITH DAVE MITCHELL AND TOM MCCARTHY

Sergey Krimchansky

STEADY HELM



For continued teamwork and success managing three critical NASA efforts.

WITH DAVE MITCHELL, CATHY RICHARDSON AND TOM MCCARTHY



Melissa Vess

STEADY HELM



For excellence in leading the WFIRST spacecraft systems engineering efforts.

WITH DAVE MITCHELL AND TOM MCCARTHY



Katie Bisci

UNSUNG HERO



For exemplary support of the WFIRST spacecraft and telescope development efforts.

WITH DAVE MITCHELL AND TOM MCCARTHY



Continued on page 32



Patricia Butler

UNSUNG HERO



For her ability to fix a critical financial oversight in the Human Space Flight (HSF) Network's budget has enabled the continuation of GSFC's HSF Network Office.

WITH DAVE MITCHELL AND TOM MCCARTHY

Janice Mcroy

UNSUNG HERO



For your dedication in providing the WFIRST with the tools and training it needs for configuration management no matter what.

WITH DAVE MITCHELL AND TOM MCCARTHY



Angela Michael

UNSUNG HERO



For providing extraordinary service to the GOES-R program as a human resource administrative officer.

WITH DAVE MITCHELL, JOAN FRANK AND TOM MCCARTHY



Janet Wood

UNSUNG HERO



For successfully navigating the many EHPD programs/projects/missions though the endless complex, demanding and ever changing presentation and reporting process.

WITH DAVE MITCHELL AND TOM MCCARTHY





Janice Smith

UNSUNG HERO



For your continued support to the JPSS Ground Segment project.

WITH DAVE MITCHELL AND TOM MCCARTHY

Sarah Dietrich

WILD CARD



For leading the effort in software for the ESDIS cloud project.

WITH DAVE MITCHELL AND TOM MCCARTHY



Gerard Daelemans

WILD CARD



For being the ultimate wild card for FOXSI.

WITH ART JACQUES, DAVE MITCHELL, ROB MONTGOMERY, TOM MCCARTHY



Teresa Kauffman

WILD CARD



For bringing cohesion to ESTO's resource management group through the up and downs and over the years.

WITH DAVE MITCHELL AND TOM MCCARTHY



BE OPEN-MINDED. INFORMED. COURAGEOUS. SELF-AWARE.

D&I TACKLING UNCONSCIOUS BIAS

The Flight Projects Diversity & Inclusion (D&I) Committee chose to tackle four values that through practice, will help us to understand and work to be better as a community in regards to unconscious bias. These values, when exemplified by our leadership and teams, enable us to achieve greatness and inspire the next generation to ideate our future of exploration. As the final value, Self-Aware, was launched at the start of the month, the artist behind the campaign explains a little more about the images and inspiration of the campaign.

To kick off the campaign with the call to action to **BE OPEN-MINDED**, the graphic artist, Reese Patillo, selected an image from the *Galaxy Evolution Explorer* (GALEX), managed by Goddard's Explorers program. She felt "GALEX and *Hubble* have worked hand in hand in capturing the beauty of our universe," which she first experienced while in school and which inspired her as a student and as she began her career at NASA. She then chose to use duotone coloring and impactful fonts with the image. One thousand flyers were distributed throughout campus in a 'guerrilla marketing' approach to generate interest in the conversation. The images were then used in email blasts Goddard-wide allowing for feedback, questions, dialogue and activities focused around this concept. These communication tactics continued through the campaign with each value anchored in the art and bold messaging.

The next value challenged the Goddard community to **BE INFORMED** using imagery from the *Landsat* program in blue and purple duotone. This was followed

by **BE COURAGEOUS** which coincided with the Apollo 50th campaign and utilized lunar surface images from the *Lunar Reconnaissance Orbiter* (LRO) mission in both a large format banner as well as in orange and red in the tabloid-style flyers. The closing value encourages us to understand our impact and biases with **BE SELF-AWARE** with pink-toned images from the *Solar Dynamics Observatory* (SDO) heliophysics mission.

Using these images from missions built and managed by the FPD has "been an amazing opportunity to bridge science and art," according to Patillo. This work showcases how we can look at the science being performed, enabled by the engineering and programmatic teams and utilizing our diverse and inclusive community, through another lens.

The work we perform every day requires innovation, dedication and understanding to enable mission success – we encourage you to keep the conversation going and let your work at Goddard and NASA, through this art, speak for the ingenuity and dedication it took to make missions successful. By being open-minded, informed, courageous and self-aware, we can work on our unconscious bias and continue to perform amazing feats to take the next man and the first woman to the Moon. ■

For more information, go to:
<http://bit.ly/fpdvalues>

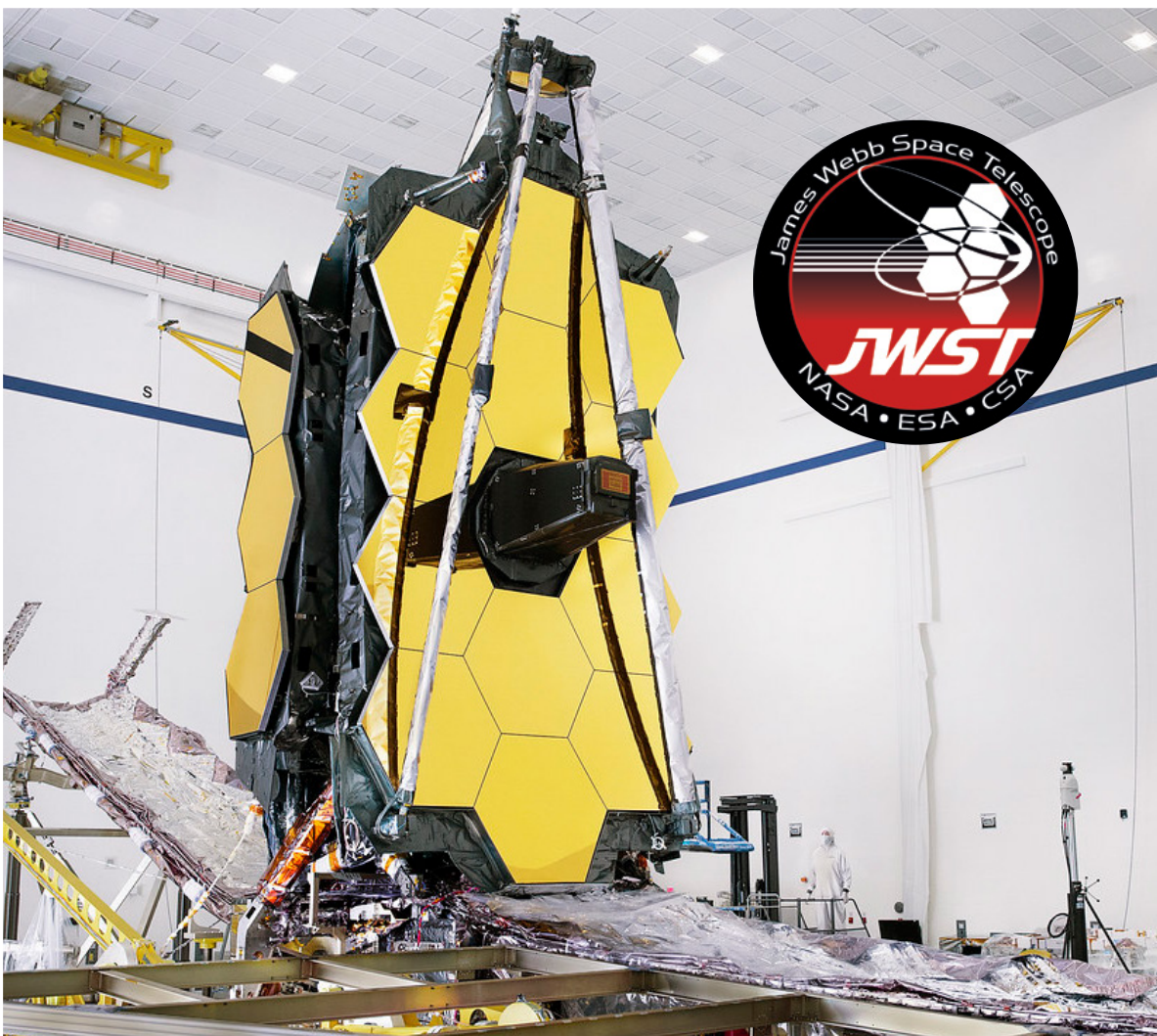
Tara Dulaney / Code 450
Project Manager & Co-lead for D&I



Congratulations to JWST Team

The James Webb Space Telescope team – comprising members here at Goddard Space Flight Center and at Northrop Grumman in Redondo Beach, California – successfully assembled Webb's observatory with its spacecraft element. Testing will now continue as the team moves toward a 2021 launch.

This milestone represents the tireless efforts of thousands across Goddard and the Agency, as well as those of partners at Northrop Grumman, the European Space Agency, Canadian Space Agency and other organizations.



**READ MORE ABOUT JWST'S PROGRESS
IN OUR NEXT ISSUE!**

FOCUS ON FACILITIES

Energy Management Investment Grade Audit

Energy conservation is EVERYONE's business. Center and agency strategies to reduce energy consumption in compliance with federal executive orders and milestones are championed by our center's Energy Manager, Evelyn Baskin in Code 224. To this end, Evelyn chairs a cross-directorate Energy Efficiency Team, which meets quarterly to discuss our energy conservation strategies. Directorate members provide feedback and serve to promote education and advocacy around our energy conservation strategies. A facilities operational team meets more regularly to discuss energy conservation opportunities and to prioritize strategies.

Nevertheless, as individual workers we all are empowered to reduce the center's energy consumption. Our sphere of control is typically the immediate workspace. Practices that reduce energy consumption include avoiding space heater use, keeping thermostats set at seasonal standards (68 degrees Fahrenheit in winter and 72 degrees Fahrenheit in summer), avoiding obstructions of heating and cooling airflow and resisting the use of automatic door openers for normal entry/egress, etc. All these little things can add up to big savings.

Funded by already realized energy savings, an Investment Grade Audit is scheduled this summer. This effort specifically undertakes the preliminary design of 21 previously identified strategies to reduce energy consumption where they exist in key targeted buildings. The audit will target our biggest energy-using facilities, which in many cases are the locations of flight project work. The deliverable will be a 35% design package including refined cost and return on investment estimates for the audited facilities. Just to reiterate, this effort is funded by energy savings we have already realized making possible even greater savings... compounded savings!!!

For more information about center-wide energy saving activities, contact me.



PLEASE, NEVER TAMPER!

Fire alarms are loud for a reason! It is shocking how many reports Code 200 receives of fire alarm tampering across the center. In case you did not know, tampering with, or impairing in any way, a fire alarm at Goddard is a federal offense. Recently, the Flight Projects Directorate was unfortunately front and center of an investigation into materials found stuffed in a fire alarm bell during an operational test.

Yes, fire alarms are loud. However, they are loud to save lives. How loud are they, you may ask? According to the National Fire Alarm Code, fire alarm audible signals are usually required to be at least 15 decibels louder than the average ambient sound levels. The codes do limit the sound level to 110 decibels at a minimum hearing distance. NASA is required to comply with the National Fire Alarm Code. All new fire alarm work is tested to ensure our fire alarm systems are within these minimum and maximum limits.

Once applied, the code ensures that fire alarms are both audible and safe for hearing, especially given that an occupant's immediate responsibility is to vacate the space when activated.

Considering this information, if you believe that your exposure potential is greater than the acceptable engineered parameters, you are encouraged to notify your supervisor or contact me, Code 400 Directorate Safety Officer, via phone or e-mail. We can request to have your situation reviewed by the Code 360 Industrial Hygiene Office. In any case, PLEASE never tamper with the bell, horn, or speaker in order to muffle the sound in any way. This latter behavior could have very serious consequences if discovered. ■

Bill Glenn / Code 400
Mission Support Manager

FLIGHT PROJECTS DIRECTORATE

ROUNDTABLE CORNER

Strategic Initiatives

The FPD senior management team met over the last few months and updated the following.

Roundtable Purpose

We are committed to enriching our people, engaging in collaborative strategic discussions, ensuring consistent communication, utilizing expertise across the directorate, and making decisions to address challenges and opportunities.



Flight Projects Directorate

VISION

Enabling amazing discoveries through excellence in project management.

MISSION

The Flight Projects Directorate leads and manages complex, one of a kind, end-to-end spaceflight missions with diverse teams of government, academia, commercial, and international partners to advance human knowledge through the exploration of our universe.



2018 ROBERT H. GODDARD

A W A R D R E C I P I E N T S

The Robert H. Goddard Awards ceremony was held on Thursday, May 16, 2019, and recognized exceptional achievement in the following areas. Here are the recipients from Code 400.

EXCEPTIONAL ACHIEVEMENT AWARD FOR: Customer Service (Individual and Team Recognition)



Daria Outlaw

For outstanding dedication to the James Webb Space Telescope (JWST) project and keeping Goddard connected to the information needed to achieve our mission.



David Back

For exceptional customer service in leading the Thermal Infrared Sensor-2 (TIRS-2) cryocooler team to deliver the cryocooler that meets requirements ahead of schedule.



John Van Naarden

For outstanding leadership in recovering the capability of the GOES-17 Advanced Baseline Imager for our nation's weather forecasting needs.



Leslie Watzin

For your outstanding customer service and dedication in any situation to the Flight Projects Directorate and the Goddard Space Flight Center.



Lynn Westine

For exceptional customer service in the successful delivery of the ICESat-2 ATLAS flight lasers.



Miles Glasgow

For outstanding contributions to TEMPO and continuously exceeding customer expectations.

EXCEPTIONAL ACHIEVEMENT AWARD FOR: Customer Service (Individual and Team Recognition)



JWST OTIS Transportation Team

For your ability to safely and successfully deliver JWST's OTIS flight hardware to multiple locations, exceeding customers' expectations along the way.



Space Communications and Network Services Team

In recognition of your tremendous contributions to supporting and progressing Goddard's largest contract, enabling vital infrastructure and myriad missions.

EXCEPTIONAL ACHIEVEMENT AWARD FOR: Engineering (Individual and Team Recognition)



Brian Comber

For outstanding thermal engineering support for the JWST OTIS test.



Eric Marquardt

For exceptional technical leadership leading to the success of the Thermal Infrared Sensor-2 (TIRS-2) cryocooler.

EXCEPTIONAL ACHIEVEMENT AWARD FOR: Engineering (Individual and Team Recognition)



Kathy Strickler

For exceptional agility, balance, creativity, dedication, integrity, respect, and teamwork in support of the ICESat-2 mission.



Olivia Billett

For outstanding engineering solutions to enable OSIRIS-REx mission operations to perform unprecedented science observations of asteroid Bennu.



Perry Greenfield

For outstanding expertise and dedication in the design and development of high speed interferometry and execution of critical JWST OTE primary mirror testing.



William Clement

For exceptional contributions to the Restore-L mission and the Satellite Servicing Project Division.



TSIS-1 Launch Team

For outstanding management, engineering expertise, and successful launch of the Total and Spectral solar Irradiance Sensor 1 to the International Space Station.

Continued on page 42

EXCEPTIONAL ACHIEVEMENT AWARD FOR: Leadership



Candace Carlisle

For exceptional leadership of the TSIS project team, from initiation through launch, and commitment to sustaining a positive work environment.



David Littmann

For exceptional leadership and dedication in overseeing the development and launch of TDRS-M.



Jamie Dunn

For outstanding leadership of the GOES-S/17 Advanced Baseline Imager (ABI) radiometric performance recovery.



Jeffrey Volosin

For outstanding leadership of the Transiting Exoplanet Survey Satellite (TESS) project, thru development, launch and on orbit commissioning.



Kevin Carmack

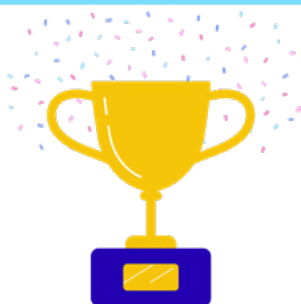
For exceptional leadership of the Laser Communications Relay Demonstration project, reaching major milestones on a high profile and complex mission.



Lavida Cooper

For exceptional leadership in developing a highly agile technology office.

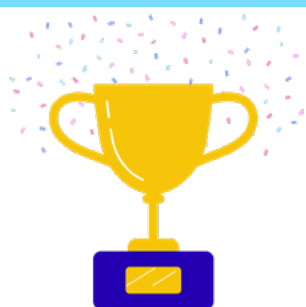
EXCEPTIONAL ACHIEVEMENT AWARD FOR: **Leadership**



Vickie Moran

For outstanding leadership of the Transiting Exoplanet Survey Satellite (TESS) project instrument team.

Mentoring (Individual and Team Recognition)



Christopher Morris

For exceptional dedication and commitment to mentorship and knowledge sharing across Goddard to enhance project support and developmental growth.



Kevin Jones

For outstanding dedication and service to mentoring new hires and staff in the Resource Analysis Office.



Tara Dulaney Ritsko

For outstanding mentorship in support of personal and professional growth by members of the Exploration and Space Communications Division.

Continued on page 44

EXCEPTIONAL ACHIEVEMENT AWARD FOR: Mission and Enabling Support



Matthew Ritsko

For outstanding management of TESS project business activities through development, launch and on orbit commissioning and management of JPSS business activities.

Outreach (Individual and Team Recognition)



DeLee Smith

For outstanding support in the areas of outreach, website design and graphics to the Explorers and Heliophysics Projects Division.



EXCEPTIONAL ACHIEVEMENT AWARD FOR: Professional Administrative (Individual and Team Recognition)



Lateef Ajayi

For exceptional business management of the Thermal Infrared Sensor-2 (TIRS-2) resources to accomplish mission success within cost and schedule constraints.



Linda Vaughn

For outstanding administrative support to the Space Network Ground Segment Sustainment project and the Building 12 community.



Lisa Hoffmann

In recognition of your personal commitment to the success, high degree of integrity, solution oriented approach, and demonstrated excellence in support of the FPD.



Vanessa Soto Mejias

For exceptional resources support enhancing project analysis, resources plans, and reporting for the Earth Science Projects Division and Earth Systematic Missions Program.



JPSS Business Team

For outstanding efforts in executing financial planning for the Joint Polar Satellite System (JPSS) program.



Landsat 9 Scheduling Team

For exceptional project planning and scheduling, and for tirelessly going above and beyond to help make the Landsat 9 project successful.

Continued on page 46

EXCEPTIONAL ACHIEVEMENT AWARD FOR: Robert H. Goddard Award of Merit



Richard Burns

For outstanding management of operational planetary, astrophysics, and heliophysics missions.

Secretarial/Clerical



Alicia Jose

For exceptional administrative expertise, remarkable customer support, and exemplary performance.



EXCEPTIONAL ACHIEVEMENT AWARD FOR:
Technicians/Wage Grades (Team)



EDISN Team

For outstanding performance, superior dedication, and attentiveness in the integration of a new digital architecture, which enabled higher data rates for the ISS.





Dr. Azita Valinia

Astrophysics Projects Division (Code 440)

Deputy Associate Director

Physics of the Cosmos & Cosmic Origins

Deputy Program Manager & Chief Technologist

Athena, Study Manager

Born In an exotic land 10,169km from Washington, DC

Education MPhD, Physics: University of Texas at Austin
BS, Physics: University of Houston

Life Before Goddard

Azita spent a fair amount of time in Texas, first in Houston pursuing her Bachelor of Science in Physics at the University of Houston, and later in Austin working on her PhD in Physics at the University of Texas. Her initial PhD dissertation topic was on nuclear fusion, designing research experiments at the Texas Experimental Tokamak. After a year, she changed her topic to theoretical astrophysics focusing on cosmology and large-scale structure formation modeling in the universe, using high performance computational techniques involving supercomputers. A year before graduation, she was selected to attend a high performance computational workshop which was held at NASA GSFC. There, she was taught by top-notch NASA computational scientists on how to develop complex scientific codes on supercomputing platforms (by the way, she ended up marrying one of the instructors at that workshop several years later!). During the GSFC workshop, she found out that there were opportunities at GSFC as a National Research Council (NRC)

postdoctoral fellow. When she went back to Texas, she applied for the NRC fellowship. At first, she actually missed the application deadline, but due to the historic North East blizzard of 1996 in Washington, DC, and shut down of the entire city, the NRC extended its application deadline, and Azita got a second chance. A few months later, Azita was selected for the fellowship, got her PhD, packed her bags for Greenbelt, MD, and reported to work at the Laboratory for High Energy Astrophysics at GSFC.

Life at Goddard

As a freshly minted astrophysicist, Azita worked feverishly the first few years as a NRC postdoc fellow. The academic mantra of “publish or perish” practically guarantees no life outside work for young scientists and this was no exception for her. During her first couple of years at GSFC, she worked on data analysis from the Rossi X-ray Timing Explorer (RXTE) and Compton Gamma Ray Observatory (CGRO), published numerous technical papers (including a seminal paper on the distribution of the X-ray emission

from the Galactic disk), gave talks at technical conferences, and submitted a large number of proposals to NASA for funding (with about 80% success rate). About 18 months into her fellowship, the Director of the Laboratory for High Energy Astrophysics noticed her work and asked her to lead the science and technical feasibility team for the Constellation-X mission (currently re-incarnated as the Athena mission led by the European Space Agency (ESA)). She accepted the position and led the Constellation-X team through science and concept formulation studies.

In 2000, Azita made a major career move, accepting a civil service position at NASA Headquarters, in the Earth Science Enterprise division. There, she worked on the development of a high performance computational capability strategy to enable climate and weather research at NASA. She also led the development of publications that described NASA Earth science accomplishments for advocacy to major stakeholders. She originated the publication “A Year in Review” for the Earth Science Enterprise, which was so successful that the



At Work: JPL Exhibit. CREDIT: ALL PHOTOS COURTESY OF AZITA VALINIA

Associate Administrator at the time arranged for it to be sent to a large distribution of stakeholders in Washington, DC. In 2003, she led the development of NASA's Earth science technology investment strategy, which informed the first Earth science decadal survey. In 2004, she joined the Space Science Directorate at GSFC, first as the chief technologist and later assumed more responsibilities and became the Associate Director for research and development of the combined Earth and Space Science Directorate (Code 600), leading strategic planning and new business development. During this time, while working closely with leadership from Engineering and FPD, as well as the Office of the Center Director, she contributed toward the strategy for successful capture of several missions in Earth and Space Sciences.

In 2015, Azita moved to FPD and currently serves as the deputy Associate Director of the Astrophysics Projects Division (APD) with a portfolio of several missions in formulation as well as over 20 space science missions in operation (including Hubble). Additionally, she serves as the deputy program manager of two of NASA's astrophysics programs: Physics of the Cosmos and Cosmic Origins. The program portfolio includes a number of mission concept formulations (such as Athena and Laser Interferometer Space Antenna (LISA), collaborating with ESA) as well as over 50 active strategic technology development projects planned to be infused in future astrophysics missions.

Azita is the author of over 50 technical journals and editor of

“The greatest danger for most of us is not that our aim is too high and we miss it, but that it is too low and we reach it.”

Michelangelo

books ranging in topics from theoretical and experimental astrophysics, high performance computing, remote sensing technology, Earth science applications, technology investment strategy, concepts for telerobotic experiments in the solar systems, and even ideas on shaping America's energy policies using advanced technology. She is one of the co-founders of the “Women of Flight” community of practice at FPD, chair of GSFC's Women Advisory Committee from 2018-19, and is active in promoting diversity and inclusion initiatives in the workplace.

Life Outside Goddard

Azita lives in Potomac, Maryland, with her husband (Peter, who is a space weather physicist), her daughter (Elizabeth, who speaks Chinese) and her cat (Portia, who loves the company of all humans). In her spare time, Azita likes to learn new languages on Duolingo. Her bucket list includes visiting exotic islands around the globe. ■



Women of Flight Meeting. CREDIT: TODD GOOGINS



John Decker

Retiree

Life Before Goddard

John Decker grew up in northern New Jersey, in the suburbs of New York City. He earned his bachelors degree at the University of Pennsylvania in Philadelphia, PA, and then went on to earn his masters degree at the New Jersey Institute of Technology in Newark, NJ. A job offer from the Bechtel Power Corporation brought him to Maryland in July 1979, and, in October 1985, a job offer from the Goddard Space Flight Center's mechanical systems branch brought him to NASA.

Life at Goddard

Soon after coming to Goddard, John was assigned to support the Hubble Space Telescope project, and he subsequently served as its lead mechanical systems engineer for almost 12 years, from Hubble's launch through the first three Hubble servicing missions. In 1997, he became the head of Goddard's Mechanical Systems Analysis and Simulations branch, but in 2000 he returned to the Hubble project to serve a one-year detail as its deputy program manager. In 2001, he was



John and his brother (and sometimes travel partner) Bill visit a snow-covered volcano in southern Chile. CREDIT: ALL PHOTOS COURTESY OF JOHN DECKER

asked to serve as the chairperson of the source evaluation board for the James Webb Space Telescope (JWST) observatory prime contract, and afterwards he was offered the position of JWST deputy project manager. He remained in that role until January 2011, when he became the Associate Director of the Flight Projects Directorate (FPD). Although his official retirement from NASA occurred in August 2013,

he continued serve as a part-time management consultant to the FPD until his full retirement in August 2016. Ever since then, he has served as an emeritus consultant to the FPD.

Life Outside Goddard

John's emeritus role has enabled him to serve as a volunteer consultant and mentor to folks at Goddard who are interested in picking his brain about his



John in the front seat while whitewater rafting in Costa Rica.



John performing as Peter Quince in a 2018 production of "A Midsummer Night's Dream."

NASA roles and experiences. It has also permitted him to stay in close contact with his Goddard colleagues, and to monitor the progress that is being made on all of Goddard's numerous endeavors, including two of his favorites, the Hubble Space Telescope and the James Webb Space Telescope. John has always enjoyed conducting informal tours of Goddard for his family and friends, but his emeritus status has afforded him the opportunity to conduct formal tours as a volunteer Goddard Visitor Center tour guide.

Ever since his high school years, and throughout his busy NASA career, John has managed to find the time to pursue his many outside interests, and, in particular, his passions for both theater and travel. Since his retirement, John has continued to be in great demand as an actor and set designer, and he has also had many wonderful opportunities to travel



Touring Cuba in a 50s-style automobile.

to exotic locations all around the world. In fact, in just the past 4 years, he has had the privilege and pleasure to travel to such far-flung locales as Ecuador, the Galápagos Islands, South Africa, Botswana, Zimbabwe, Zambia, Costa Rica, Cuba, China, Burma, Thailand, Laos, Cambodia, Italy, Canada, Brazil,

Belize, Guatemala, Honduras, Chile, Argentina, India and Egypt. As long as his health (and his retirement budget) permit, John plans to continue to his adventurous world travels for many years to come. ■

KNOWLEDGE MANAGEMENT *Insights*

Drop Your Tools: Learning and Adapting



It is summer, which means lists of good beach reads. Though not as pulse pounding as a good spy novel, **Range** by David Epstein caught my attention. Epstein's book covers the value of breadth as well as depth and the benefits of both in being prepared for unanticipated events. Moreover, it provides lessons that that can be put to work, once back from vacation.

Mann Gulch Fire

In 1949 fifteen smokejumpers parachuted into Montana's Mann Gulch to fight a fire that did not seem out of the ordinary. They expected to face a 'ten o'clock fire,' meaning they would have it contained by 10 a.m. the next morning. High winds suddenly caused the fire to rapidly expand, moving uphill at an alarming rate of eleven feet per second. The flames cut off the firefighters' route, forcing them back uphill. The crew foreman yelled to his men to drop their heavy tools and run to safety – two did just that. Perplexingly, others refused; they held onto their heavy saws and axes and were caught by the flames due to their slow progress. One firefighter never removed his heavy pack; he stopped fleeing and sat down, exhausted. In total, the fire claimed the lives of 13 firefighters. The Mann Gulch tragedy led to reforms in safety training. However,

wildland firefighters continued to lose races with fires when they did not drop their tools.

This tragedy is an illustration of a tendency to grasp tightly to what we know and use tools or approaches that worked in the past. The "Einstellung effect" is the inclination to utilize familiar methods, even when better ones are available. Other examples are documented: Navy seamen punched holes in life rafts after refusing orders to remove steel-toed shoes upon abandoning ship. Fighter pilots ignored orders to eject from disabled planes.

Dropping tools was not part of the Wildland firefighters "can do" culture. For sociologist, Karl Weick, the firefighters are a metaphor for normally reliable organizations that cling to trusted methods. Experienced groups can become rigid under pressure and "regress to what they know best." Conversely, "dropping one's tools is a proxy for unlearning, for adaptation, for flexibility."

Challenger

Epstein's book offers lessons from NASA, specifically decisions related to **Challenger**.

"In God We Trust, All Others Bring Data"

In 1986, the NASA 'can do' culture was exemplified by its vaunted procedures and quantitative standards. By then, twenty-four space shuttle flights had been

safely returned. The NASA process included a tough flight readiness review where everything was done 'by the book.' An engineer who was on a **Challenger** conference call said, "If I feel like I don't have data to back me up, the boss's opinion is better than mine." Absent stringent and inhibiting data, there was silence. From his interpretation of a photograph, Thiokol's Roger Boisjoly argued they were moving: "away from goodness." It was dismissed.

Challenger was a wicked problem outside of previous experience. It was one rife with uncertainty. NASA's mistake was to rely overly on quantitative analysis. The numbers they had did not contain the answer. However, accepting a qualitative argument was almost like being told to forget you are an engineer. Like the firefighters, NASA managers had merged with their tools.

According to Diane Vaughan, the NASA culture "was grounded in conformity" and yet it had not always been this way. During the period before Challenger, Gene Kranz would regularly seek opinions of engineers and technicians at all levels of the organization. If he heard the same concerns more than once, he did not require data to stop the process and investigate.

A cultural carbon copy of **Challenger** was the 2003 **Columbia** fatal shuttle accident. Again, lower level engineers were not able to quantify their concerns so they stayed silent. Hierarchy and procedure were adhered to at the expense of safety.

For experienced professionals, dropping tools can be difficult. The use of those tools can be so automatic that they are not seen as situation-specific. Yet, tools can be reimagined, repurposed, or dropped in lieu of new ones, to navigate unfamiliar challenges.

Learning and Adapting

In 2009 psychologists Daniel Kahneman and Gary Klein answered the question: does more experience lead to mastery? The answer, it depends.

A **kind** learning environment is one of deliberate practice (10,000 hours rule) and intense specialization. Rules are known, consequences, immediate, and challenges, consistent. Practice involves feedback, error correction, and repetition. Chess and golf are examples of kind learning.

In a **wicked** learning environment rules are undefined and feedback is delayed or inaccurate. Strategies that worked in the past may no longer be applicable. According to Epstein, we are living in an increasingly **wicked** world.

The Mann Gulch Fire is an allegory about the vulnerabilities organizations face when faced with wicked problems and mistakes escalate. Long before decisions like these become visible, the conditions for these outcomes have been ongoing.

What can be done closer at hand?

When action can still make a difference

- Surface and test one's intuitive understanding of events
- Hew to traditional processes that have value; deviate readily when they do not
- Improvise to rapidly replace a traditional model with new approaches

To maintain resilience

- Communicate early, communicate often
- Avoid both extreme overconfidence and extreme caution
- Maintain curiosity, openness, and the ability to sense complex problems

Collective sensemaking activities are integral to build resilience and broaden an organization's decision making tool box. At NASA/Goddard, these activities include Pause and Learns (PaLs), Knowledge Sharing Workshops, Case Studies, Masters Forums, and Communities of Interest (COI). Please contact the Flight Projects Knowledge Management lead to leverage these services or to learn more. ■

Judy Dickinson / Code 400
FPD Knowledge Management Lead

For more information:

- Epstein, David **Range**, 2019
- Weick, Karl, Harvard Business Review, **Prepare Your Organization to Fight Fires**, 1996
- Pause and Learn Brochure
- Goddard Knowledge Exchange

Coming and Goings

April 1 through
June 30, 2019



Comings

Jerry Mason (566) – Reassigned to 450.1/ Networks Integration Management Office (NIMO) Office Chief



Goings

Katy Mikkelsen (420) – Retirement from Earth Science Projects Division (11/30/18)

Dawn Lowe (420) – Retirement from Earth Science Projects Division

Paul Richards (450.2) – Retirement from Technical Enterprise Mission Pathfinder Office (TEMPO)

Javier Lecha (450.3) – Retirement from Search and Rescue (SAR)

Ruth Carter (401) – Retirement from Advanced Concepts and Formulation Office

Jean Grady (472) – Retirement from Joint Polar Satellite System (JPSS) Flight



Reassignments/ Realignments Details within Code 400

Kelly Hyde (444) - Reassigned to 444/Space Science Mission Operation (SSMO) Project Support Manager

Karen Rogers / Code 400
Administrative Officer



Congratulations to Barbara Haskell on the birth of her fourth grandchild. Her son, Daniel, and daughter-in-law, Nancy, welcomed Adalyn Ericka Haskell on July 1, 2019, weighing 8lbs, 8 oz.

OUT & ABOUT

LIFE'S HIGHLIGHTS
OFF CAMPUS



Dylan Cristy and Michelle Belleville took a holiday to Europe in June visiting England, France, Czech Republic and Germany. Photo was taken at the Charles Bridge overlooking the Vltava river in Prague.



After leading successful projects such as GOES-R, OSIRIS-REx, and most recently, Lucy, Project Manager Mike Donnelly retired from Goddard on July 31, 2019, after 30 years of Government service. Friends gathered at the Blackwall Hitch restaurant in Annapolis to wish him well in his retirement.

Share your news!
Weddings, births,
interesting travel
experiences...we
want to know!

Please send your inputs to
Paula Wood. Include your
name, phone number to:



paula.l.wood@nasa.gov



Code 460



Ext. 6-9125

THE LATEST SAR SAVES

NASA'S SEARCH AND RESCUE (SAR) OFFICE CONTINUES ITS EFFORTS TO DEVELOP AND IMPROVE ON LIFE-SAVING DISTRESS BEACON TECHNOLOGIES.



Each icon on this map represents one rescue event, though multiple saves may be involved with each event. The Search and Rescue Satellite Aided Tracking (SARSAT) system is able to detect three types of beacons:

Personal Locator Beacons (PLBs)



Used primarily by hikers and outdoor enthusiasts

Emergency Position Indicating Radio Beacons (EPIRBs)



Used by commercial and recreation ships

Emergency Locator Transmitters (ELTs)



Used by civilian aircraft

COSPAS-SARSAT rescues from April 2019 through August 2019 are shown above.

DID YOU

ADA 30



Americans with Disabilities Act
Celebrate the ADA! July 26, 2020

Did you know that July 26th recognizes the anniversary of the Americans with Disabilities Act of 1990? The Act protects individuals with disabilities from discrimination. Nearly 1 in 5 of Americans have a documented disability.

KNOW...?

We want to be in the know!

If you have something to share, send it to Matthew Ritsko. Include your **name**, **phone number** and send it to:

 matthew.w.ritsko@nasa.gov

 Code 400 Diversity and Inclusion Committee

 Ext. 6-2515

FPD Mission Updates



Parker Solar Probe continues on its record-breaking exploration of the Sun with more data than expected!



[Read the full article](#)



Transiting Exoplanet Survey Satellite (TESS) celebrates its first birthday exceeding expectations and expanding our knowledge of the universe.



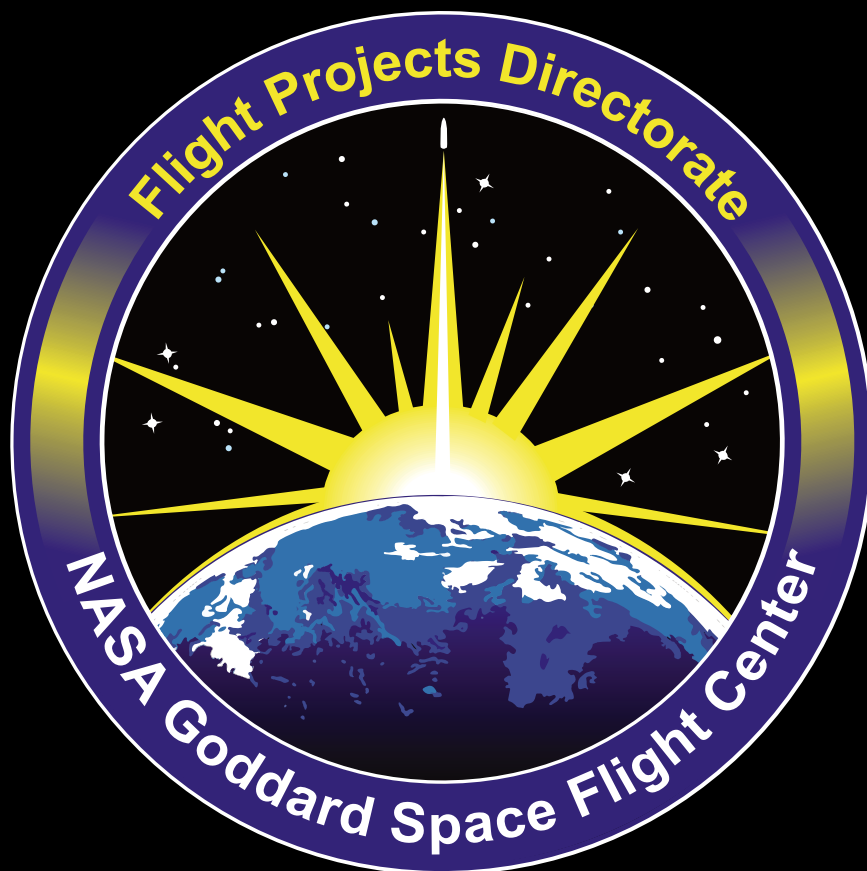
[Read the full article](#)



Images from FPD missions, including Hubble, OSIRIS-REx, and the Solar Dynamics Observatory, were among those featured in the winning "Interactive Design – Web Design" category of the 2019 Adobe Creativity Awards, which presented "Space Valentines."



[Read the full article](#)



The Flight Projects Directorate has a new logo!

The image represents FPD's mission elements which encompass Earth science, Heliophysics, and Astrophysics, among others. Thanks to all those who submitted logo ideas and congratulations to Jay O'Leary for submitting the winning design. Dr. Wanda Peters provides more information on the selection process in her video message ([see page 5](#)).

We have t-shirts! Visit the FPD portal for where to purchase your own t-shirt. [Click here](#) for more information.



Contest winner

Jay O'Leary